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10/629,116	07/28/2003	Peter Mardilovich	200309593-1	5931

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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
LEE, CYNTHIA K	
ART UNIT	**PAPER NUMBER**
1795	

NOTIFICATION DATE	DELIVERY MODE
08/21/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM
mkraft@hp.com
ipa.mail@hp.com

Office Action Summary	Application No.	Applicant(s)	
	10/629,116	MARDILOVICH ET AL.	
	Examiner	Art Unit	
	CYNTHIA LEE	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *49-84* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *49-84* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Reopening of Prosecution After Appeal Brief or Reply Brief

1. In view of the appeal brief filed on 8/18/2006, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

Response to an Appeal Brief

This Office Action is responsive to the Appeal Brief filed on 5/23/2008. Claims 49-84 are pending. Applicant's arguments have been fully considered. Applicant's arguments with regard to Haluzak are persuasive. Upon further consideration, the

instant claims are rejected under new grounds of rejections and thus, claims 49-84 are non-finally rejected for reasons stated herein below.

Applicant's arguments to the 35 USC 112, 1st rejection are persuasive and thus, is withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 55 and 57 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear and indefinite as to what constitutes "substantially" uniform pores.

Claim 55 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 55 contracts claim 49 from which it depends. It is unclear as to how pores that vary in diameter through a thickness of said substrate (claim 49) can be also "substantially uniform in size and shape" (claim 55).

Claim 58 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear to the Examiner as to what structure constitutes "pre-selected desired" porosity. It is further unclear whether the Applicant intends to place a comma between "said substrate" and "and" in line 6 of claim 58.

Claims Analysis

The limitation "pre-selected" in "pre-selected desired porosity" has been considered but was not given patentable weight because the courts have held that the method of forming the product is not germane to the issue of patentability of the product itself. "[Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from the product of prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113. Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).

The Examiner notes that there is no structural difference between an electrolyte with a porosity that was determined before or during or after the manufacture.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 49, 50, 56, 58, 59, 65, 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Agruss (US 3503808).

Agruss discloses a fuel cell comprising a support substrate supporting a cathode, anode, and electrolyte and a plurality of pores formed through said substrate, said pores having a size and shape formed in accordance with a pre-selected desired porosity. The anode and cathode comprise potassium and thallium and are solid anode and cathode material (claim 58).

The electrolyte is deposited in the pores (2:20-40). Agruss discloses that the support substrate is made of porous Alundum (2:35). Alundum is defined as

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Alundum
noun Trademark

A hard material composed of fused alumina, used as an abrasive and a refractory.

Collins English Dictionary, © HarperCollins Publishers 2000

APA | MLA | Chicago : **Citing this entry**
Alundum. (2000). In *Collins English Dictionary*. Retrieved November 24, 2006, from http://www.xreferplus.com/entry/2616224

The Examiner notes that pores formed of fused particles will not be uniform in shape. Due to the irregularity of the pores shapes and sizes, it is noted that the pores will vary in diameter through various cross sections of the Alundum substrate, thus varying in the thickness direction.

Claims 49, 50-52, 55, 56, 58-61, 64, 70-72, 74, 75, 77-81, 83, and 84 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito (US 5234722).

Ito discloses a fuel cell with a solid electrolyte film being formed on a substrate made of flat porous alumina substrate (see Abstract and 6:30-55). The anode and the cathode are disposed on both sides of the porous substrate coated with electrolyte. See fig. 5.

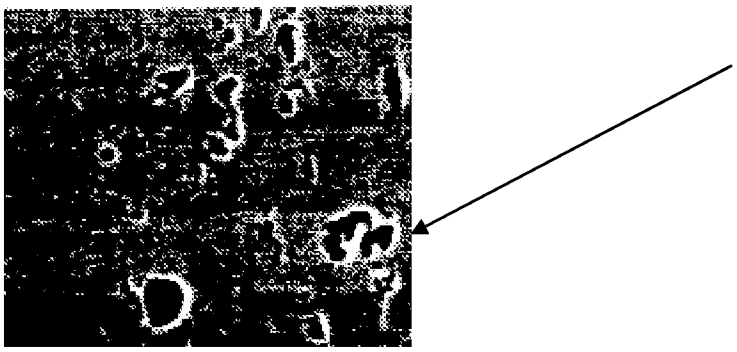
The cathode is made from LaMnO3 and the anode is made from nickel-zirconia cermet (6:15-22). The electrolyte is made from yttria stabilized zirconia (6:34).

Regarding claim 69 and 78, it is noted that in the plasma spray of the electrolyte, a composition of alumina is mixed with the electrolyte material and sprayed on a porous alumina substrate. Thus, in the heating step, the alumina will fuse with the electrolyte, and thus forms a region on a microscopic scale that possesses both the electrolyte and alumina (the porous substrate material). Further, the Specification in par. [0038] supports that any suitable method of depositing the electrolyte may be used. Thus, the electrolyte deposited by plasma spray of Ito will necessarily have the porous substrate mixed with the electrolyte.

Regarding claim 49 and 60, it is noted that the pores are not completely spherical in shape. See fig. 1 and 2. Thus, it is noted that the pores vary in diameter through various cross sections of the alumina substrate, thus varying in the thickness direction.

Regarding claim 51, its pores vary in diameter by tapering to a narrow point between two openings both openings being larger than said narrow point. Refer to a portion of fig. 1 below:

FIG. 1

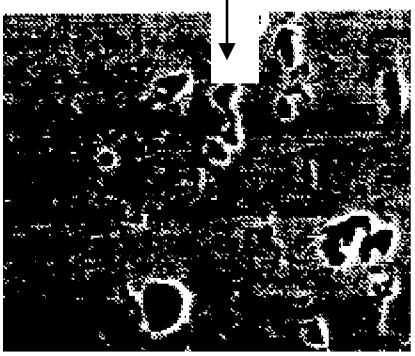


Regarding claims 52 and 61, the pores branch within the substrate. See fig 1 above.

Regarding claim 55 and 57, Fig 1 and 2 depicts images of the porous substrate. Absent a definition of what the Applicant means by “substantially,” the pores shown in Fig 2 and 3 meet the limitation “substantially uniform in size and shape.”

Regarding claim 64, the pores are parallel. See fig. 1 below:

FIG. 1



Claims 58,60-62,64,67 are rejected under 35 U.S.C. 102(b) as being anticipated by Faita (US 5482792).

Faita discloses a bipolar plate and a gasket that supports a cathode, anode, and an electrolyte. Faita's bipolar plate or the gasket reads on Applicant's substrate. See Fig. 1. Faita discloses plurality of pores 2 or 9) and 3 (or 11) (fig. 2 and 3) formed through the bipolar plate or the gasket. The pores branch and taper to a narrow point between the openings of 2(or 9) and 3 (or 11). The branching results in a greater number of pore openings on a first side of said substrate than on a second side of the substrate. It is noted that the pores 3 (or 11) are smaller than pores 2 (or 9). The electrodes are made of carbon cloth supporting catalyst particles with a binder (13:17-23).

Regarding the limitation “wherein said anode is disposed on said first side of said substrate and said cathode is disposed on said second side of said substrate” (applicant’s claims 54 and 63), it is noted that the bipolar plate delivers reactant gases

on both sides of the plate to the anode and cathode (7 in fig. 6). Thus, one side of the bipolar plate disposes the anode and another side of the bipolar plate disposes the cathode.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 76 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (US 5234722) as applied to claim 58, in view of Hibino (A low-operating-temperature solid oxide fuel cell in hydrocarbon-air mixtures, Science, vol 288, pgs 2031-2033).

Ito does not disclose that the fuel cell is a single chamber fuel cell. However, Hibino discloses a solid oxide fuel cell that is a single chamber fuel cell. It provides for a more compact design because the reactant gases do not have to be separated. The compact design also would reduce any issues with sealing the anode and cathode reactant gases from each other. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the fuel cell of Ito a single chamber fuel cell for the benefit of designing a more compact fuel cell.

Claims 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (US 5234722) as applied to claim 72, in view of Doshi (US 6558831).

Ito discloses that the fuel electrode is made of nickel-zirconia cermet, but does not disclose that the fuel electrode is made from nickel and yttria-stabilized zirconia cermet. However, Doshi teaches that the anode is a nickel/YSZ. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Ito's anode material for Doshi's nickel/YSZ because nickel-zirconia cermet and nickel/YSZ are art recognized equivalents as an anode material. See MPEP 2144.06.

Claim 82 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (US 5234722) as applied to claim 81, in view of Doshi (US 6558831).

Ito discloses that the fuel electrode is made of nickel-zirconia cermet, but does not disclose that the fuel electrode is made from nickel and yttria-stabilized zirconia cermet. However, Doshi teaches that the anode is a nickel/YSZ. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Ito's anode material for Doshi's nickel/YSZ because nickel-zirconia cermet and nickel/YSZ are art recognized equivalents as an anode material. See MPEP 2144.06.

Claims 49, 51-53,55,57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faita (US 5482792) in view of Spear (US 6051331).

Faita discloses a bipolar plate (applicant's substrate) that supports a cathode, anode, and an electrolyte. See Fig. 1. Faita discloses plurality of pores 2 and 3 (fig. 2) formed through the bipolar plate. The pores branch and taper to a narrow point between the openings of 2 and 3. The branching results in a greater number of pore openings on a first side of said substrate than on a second side of the substrate. It is noted that the pores 3 are smaller than pores 2.

Regarding the limitation "wherein said anode is disposed on said first side of said substrate and said cathode is disposed on said second side of said substrate" (applicant's claims 54 and 63), it is noted that the bipolar plate delivers reactant gases on both sides of the plate to the anode and cathode (7 in fig. 6). Thus, one side of the bipolar plate disposes the anode and another side of the bipolar plate disposes the cathode.

Faita discloses that the bipolar plate is made of metals (6:2), but does not disclose that it is made of ceramics (applicant's claim 49). Spear teaches a bipolar plate made of ceramics (3:37). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Faita's bipolar plate of metal with Spear's ceramic bipolar plate because it has been held by the court that the selection of a known material based on its suitability for its intended use is'prima facie obvious. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Se MPEP 2144.07

Response to Arguments

Applicant's arguments with respect to Haluzak filed on 5/23/2008 have been considered and are persuasive. Thus, rejections with respect to Haluzak have been withdrawn.

Only the relevant arguments are addressed below:

In regards to Applicant's arguments regarding claim 55, it is noted that the language "each of the uniform pores" is not recited in the claim, and thus, the 35 USC 112, 2nd rejection is maintained.

Applicant argues that the language "pre-selected desired porosity" is clear, referring to the instant Specification par. [0029].

The Examiner remains unpersuaded. The language "pre-selected desired porosity" is indefinite because it does not describe the metes and boundaries of the porosity. Contrary to the Applicant's assertion, the paragraph in the Specification relied on for support also does not define what is meant by "pre-selected desired porosity". As stated by the Applicant, it is noted that "pre-selected desired porosity" is a concept, and does not structurally define the porosity (emphasis added).

Applicant argues that the electrode materials of Agruss are solutions and not solid cathode and solid anode material.

The Examiner reiterates that claim 58 recites a solid cathode material and a solid anode material. It is noted that potassium and thallium are solid materials because at temperature 173 C or below, thallium is solid (3:5-15). Thus, when the fuel cell is starting up from room temperature to its operating temperature, the fuel cell of Agruss would read on the instant claim limitations of "a solid cathode material" and "a solid anode material".

Regarding Applicant's arguments with respect to Ito, it is the Examiner's position that the electromicrographs show the varying sizes of the pores that read on Applicant's claims. Further, in light of the 35 USC 112, 2nd rejection, it is noted that the porosity has been pre-selected because the electrolyte is made as a porous material.

Regarding Applicant's arguments with respect to Faita, Applicant has not pointed out how the language of the claims patentably distinguishes them from Faita. The arguments are only statements with no support as to why the art rejections of record do not meet the claimed limitations. Applicants have not specifically pointed out the errors of the Examiner's art rejections. Applicant must discuss Faita explaining how the claims avoid the references or distinguish from them. It is noted that the gas hole pathways still read on Applicant's claimed pores.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Cynthia Lee/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795